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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/980,825

04/01/2002

Martin Russell Harris

P07421US00/RFH

1538

7590

12/10/2004

GREENBLUM & BERNSTEIN, P.L.C.
1950 ROLAND CLARKE PLACE
RESTON, VA 20191

EXAMINER

KWOK, HELEN C

ART UNIT

PAPER NUMBER

2856

DATE MAILED: 12/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/980,825

Applicant(s)

HARRIS ET AL.

Examiner

Helen C. Kwok

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 30, 2004 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,214,279 (Hakamata) in view of U.S. Patent 5,148,733 (Beller).

With regards to claims 1-3 and 30-31, Hakamata discloses a scanning microscope and tuning fork scanning mechanism comprising, as illustrated in Figures 1-11 and 17, a tuning fork 30 having a base 30a and a pair of tines (as observed) having tips (the upper top portion of the tines) remote from the base and formed of a magnetic material (i.e. steel) in which a magnetic field can be induced; a cylindrical electrical coil

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31S having a substantially linear longitudinal axis (i.e. the lengthwise direction running along the coil) within the coil such that a portion of both tines being located within the coil (i.e. since the coil is wound around the tuning fork, the tines are within the coil) and parallel to the longitudinal axis (i.e. the tines are running along with the longitudinal axis; hence parallel) whereby at least one of the tines can be vibrated relative to the other tine by passing a uni-directional current (i.e. square wave form) through the coil and inducing mutually transverse repulsive magnetic fields in the tines. (See, column 3, lines 54-61; column 16, lines 27-39). The only difference between the prior art and the claimed invention is there is no portion of the coil being located between the tines of the tuning fork. Beller discloses a pole piece to decrease magnetic flux intensity comprising, as illustrated in Figures 3-13, a tuning fork pole piece 10 or 20 or 40 (as observed in Figures 3, 4, 6 respectively) with tines 12,14 for pole piece 10 or tines 24,26 for pole piece 20 wherein the tuning fork pole piece includes a coil 84 wrapped around the tuning fork pole piece such that there is no portion of the coil being located between the tines of the tuning fork. (See, as observed in Figure 10; column 3, line 57 to column 5, line 19). It would have been obvious to a person of ordinary skill in the art at the time of invention to have readily recognize the advantages and desirability of employing the teaching of Beller of locating the tuning fork within the coil with no portion of the coil being located between the tines of the tuning fork in lieu of how the coil is being positioned in the apparatus of Hakamata to alter the paths of the magnetic flux lines at the same fundamental and harmonic frequencies such that the moving flux lines cut

across the coil and generates voltages therein which define a signal having frequency characteristics of the vibration. (See, column 3, lines 34-41 of Beller).

With regards to claims 4-5, as observed in Figure 17, the tips of the tines protrude from the coil (the tines are not completely covered by the coil 31S) and the coil is elliptical (as disclosed in column 16, lines 31-32, the coil is wound around the tuning fork, hence the coil can either take the shape of the tuning fork or it can be wrapped around forming a spiral shape or elliptical shape around the tuning fork. Hence, the shape of this coil can be considered elliptical.).

With regards to claims 6 and 9, as observed in Figure 17, additional magnetically permeable material or a biasing permanent magnet 30F located outside of the coil or located around at least a portion of the tuning fork.

With regards to claims 7-8 and 11, Hakamata does not teach one of the tines is massive than the other and that the massive tine is tapered. It is well known to a person of ordinary skill in the art at the time of invention to have readily recognize the advantages and desirability of constructing one of the tines more massive than the other tine to adjust the resonance frequency. This is usually done by adding an additional mass or trimming the mass. Furthermore, Hakamata does not explicitly test tapering the more massive tine as presently claimed. However, the reference does suggest different dimensions for the tines of the tuning fork, as shown in Figures 8-11. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to construct tapered tines such that the durability of the tuning fork can be

kept good and to adjust the amplitude of vibration of the tuning fork. (See, column 7, lines 7-43; column 13, line 61 to column 14, line 24).

With regards to claim 10, Hakamata further discloses an optical fiber located on one of the tines, as observed in Figure 2.

With regards to claim 12, the coil 31S is a former-less coil (which is well known to an artisan in the art as commented on page 16 of the Amendment).

With regards to claims 13-16 and 32-35, Hakamata suggests the sensor is a fiber sensor system in a scanning microscope for providing an output signal indicative of a movement of the tines. (See, column 3, lines 3-42). Although neither of the references explicitly suggests a piezoelectric sensor or a hall effect sensor or a series of capacitive sensor located on the tines for providing an output signal indicative of a movement of the tines as claimed in claims 32,34-35, it would have been obvious to a person of ordinary skill in the art to have readily recognize the advantages and desirability of employing either a piezoelectric sensor, a hall effect sensor or a series of capacitive sensor in lieu of a fiber sensor system since using other sensors can be used without departing from the scope of the invention and is not necessarily limited to such sensors since the operation and performance of the device would not have been altered and changed, namely to determine the movement of the tines of the tuning fork.

With regards to claim 17-29 and 36-41, the claims are directed to a method for vibrating a tuning fork and are commensurate in scope with claims 1-16 and 30-35. Hence, these claims are rejected for the same reasons as set forth above.

Response to Amendment

4. Applicant's arguments with respect to claims 1-41 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The references cited are related to a tuning fork sensor have coil located on the tines of the tuning fork.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen C. Kwok whose telephone number is (571) 272-2197. The examiner can normally be reached on 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron E. Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

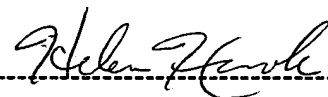
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in cursive script, reading "Helen C. Kwok", is positioned above a horizontal dashed line.

Helen C. Kwok
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hck
December 3, 2004